AMENDMENTS TO THE SPECIFICATION

On page 4, please replace the paragraph beginning on line 5 with the following rewritten paragraph:

-- Electroactive polymers have been described ~~Perline~~ in Pelrine et al. (2000), "High-Speed Electrically Actuated Elastomers with Strain Greater than 100%," *Science* 287:836-839, as well as in a number of PCT publications. (*See* WO01/58973, WO01/59852, WO01/06575, and WO01/06579.) Such electroactive polymers represent a low-cost, high-performance actuator material capable of converting electrical energy into mechanical energy, and are of particular interest because they can be tailored to suit specific purposes. For example, the electroactive polymers described in these publications have been employed to form transducers, such as in the conversion of electrical energy into mechanical energy (and vice versa). By applying an electric field to at least two electrodes that are in contact with the electroactive polymer, the polymer may be deflected due to linear elastic strains in excess of about 100 percent. Such deflections may be exploited for use in fluid flow control devices, particularly in microfluidic or small devices.--

On page 18, replace the paragraph beginning on line 23 with the following paragraph:

-- Other electrode configurations are also possible. For example, the device may exhibit "electrodeless" or "monolithic" configurations. In some instances, the invention may be employed in conjunction systems and methods that employ an electroactive polymer and one or more electrodes that do not contact the polymer. In such systems, a noncontact electrode communicates charge to or from a portion of the polymer. In some instances, the noncontact electrode comprises a charge source such as a field emitter that transmits the charge. The charge may be transmitted through a medium such as air, a vacuum, or a specialized gas that facilitates transfer of charge between the electrode and the polymer. The medium may also comprise ionized gases, inert gases and liquids (supercritical or otherwise. The charge may include positive or negative ions or electrodes that may be used for actuation, generation, sensing, or to diminish actuation applied to polymer in one or more specific polymer portions. These systems are described in detail in U.S. Serial No. ~~_____~~10/059,033 ("Non-Contact Electroactive Polymer Electrodes," inventors Pelrine and Kornbluh, filed on January 29, 2002), published on July 31, 2003 as U.S. Patent Application Publication No. 20030141787. Optimal voltages needed to transmit such charges and other operating parameter can be determined through routine experimentation upon examination of application.--

On page 26, replace the paragraph beginning on line 8 with the following paragraph:

-- In order to control the deflection of the active area, the active area may be "biased" to deflect in only one direction. Various ways in which active area biasing may be effected are generally described in International Publication No. ~~WO99/35529~~WO98/35529. Thus, the lower surface of any active area may be biased to deflect away from or toward the substrate. In addition, the manner of active area deflection may be controlled as well. Referring to FIG. 1 as an example, if it is desired for the active area to bow (shown in FIG. 1C) rather than to wrinkle upon actuation, the active area **130** should be relatively stiff. Stiffness will impart active areas with a tendency to bow in a single arch as shown in FIG. 1C, as opposed to distorting as multiple wrinkles. Rigidity may be achieved through selecting an elastic sheet material having a high Young's modulus and/or increasing the thickness of the active region. In addition or in the alternative, material can be deposited on the lower surface **132** to enhance the lower bending stiffness and cause the active area to bow as shown in FIG. 1C. Such an approach is similar to unimorph actuators known in the art, with the exception that both ends are fixed at the immobilized areas **129**. It should also be noted that fluid present between the active area of the elastic sheet and the substrate surface also plays a role in the deflection of the active area. For example, if the fluid is at a higher pressure than pressure at the upper surface 134 of the elastic sheet, then the active area 130 will naturally bow outward as shown in FIG. 1.--

On page 29, replace the paragraph beginning on line 23 with the following paragraph:

--When a plurality of active areas is provided, the actuation means may allow for individual actuation of each active area. For example, a computer may be easily used to create and operate a fully programmable fluidic system. The active areas may be formed in small squares or other shapes analogous to pixels in a display. Depending on the number and location of the areas actuated, flow channels, pumps, and mixing channels may be formed in any of a number of combinations. The location and type of component can then be changed by changing the regions addressed. Addressing means similar to those used for display technologies known in the art may be used. For example, electron beam and optical addressing means may be used. In particular, examples of electron beam addressing means suitable for use with the invention are described in U.S. Serial No. ~~_____~~10/059,033 ("Non-Contact Electroactive Polymer Electrodes," inventors Pelrine and Kornbluh, filed on January 29, 2002), published on July 31, 2003 as U.S. Patent Application Publication No. 20030141787. Aside from their obvious advantages, e.g., small size, low cost, and disposability, microfluidic technologies employing elastic control may allow the creation of more generic systems "on the fly," thus enabling a wide variety

of additional applications. This, of course, may involve addressing individual elements from a computer-based system--